# SCIENCE



FRIDAY, MARCH 3, 1899.

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MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson N. Y.

## *GEODETIC OPERATIONS IN THE UNITED STATES.**

THE geodetic operations in the United States, as executed by the Coast and Geodetic Survey, may be grouped into three distinct periods of time. The work was authorized by Congress in 1807, but a quarter of a century elapsed before anything was done in the field worthy of the name of Geodesy. This closed the first period, which may be characterized as the era of preparation and education of public sentiment. In 1832 operations were begun with vigor, and the foundation was laid for a great national work. The Survey was conducted on the same general lines of policy for eleven years, when the reorganization of 1843 established its permanent status. No great deviation has since been made from this plan, which has now held for fifty-five years. If we eliminate the Civil War period of five years, during which work was suspended, and regard operations before the reorganization as of a preliminary nature, we have half a century of geodesy. During its comparatively short existence the Survey has been three times under the control of the Treasury Department, twice under the Navy, and once under law requiring its personnel to be army or navy officers. The direction of the work has, however, remained throughout

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made on the pupil's own body. It is interesting to see how much pure physiology, as distinct from anatomy, can be learned in this way, without the aid of complex apparatus, dissection or vivisection. Vivisection is neither employed nor referred to in any way in the book, and dissection only as it pertains to bones, muscles, the heart and the kidney. Anatomy is treated not as a finality, but as a basis for the study of function. The directions for the study of bacteria are excellent, and the practical applications of bacteriology include, among other things, the canning of fruits, the use of the tooth-brush, the cleaning of the streets, and the cleansing of wounds.

In the opinion of the reviewer physiology is usually taught in high-school courses too much as a human, and too little as a broadly biological, science. Hence some regret is unavoidable that in the present book more attention is not given to the comparative aspect. Notwithstanding this lack, the book is thorough, is calculated to arouse the interest and even the enthusiasm of the pupil, and is to be heartily recommended for use in schools.

Frederic S. Lee.
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BOOKS RECEIVED.

*A Text-book of General Physics.* Charles S. Hastings and Frederick E. Beach. Boston, Ginn & Co. 1899. Pp. viii + 768. $2.95.

*The Development of English Thought.* Simon N. Patton. New York and London, The Macmillan Company. 1899. Pp. xxvii + 415.

*The Shifting and Incidence of Taxation.* Edwin R. A. Seligman. New York and London, The Macmillan Company. 1899. Pp. xii + 337. $3.00.

*The Cambridge Natural History.* Volume IX., Birds. A. H. Evans. London and New York, The Macmillan Company. 1899. Pp. xvi + 635. $3.50.

*The Elements of Physical Chemistry.* J. Livingston R. Morgan. New York, John Wiley & Sons; London, Chapman & Hall, Ltd. 1899. Pp. xiii + 299.

*Examination of Water.* William P. Mason. New York, John Wiley & Sons; London, Chapman & Hall. 1899. Pp. 135.

*De la méthode dans la psychologie des sentiments.* F. Rauh. Paris, Alcan. 1899. Pp. 305.

*SOCIETIES AND ACADEMIES.*

THE BIOLOGICAL SOCIETY OF WASHINGTON.

The 19th anniversary meeting was held January 17th, under the auspices of the Washington Academy of Sciences, in the hall of the Columbian University, the occasion being the address of the retiring President, Dr. L. O. Howard, entitled 'Are Insects as a Class Injurious or Beneficial in their Relations with Man?' The paper was published in full in Science for February 17th.

The 301st regular meeting was held January 28th and was devoted to a consideration of the 'Great Dismal Swamp.' Dr. David White traced the geologic history of the swamp and surrounding regions, showing how successive periods of elevation and depression had resulted in the formation of a considerable area so slightly elevated above sea-level that the natural drainage is insufficient to remove the rainfall. It was stated that the present period is considered to be one of subsidence, and it was noted by later speakers that Lake Drummond is evidently increasing in size.

Mr. F. D. Gardner described the soils from a practical standpoint, with special regard to the agricultural possibilities of the land extensively reclaimed by drainage. Large deposits of peat exist, which it has not been found possible to utilize on a commercial scale. The water of the streams and drainage ditches is very strongly impregnated with the soluble products of the enormous quantities of decomposing vegetable matter, and, like the soil, has a distinctly acid reaction. This acidity of the soil may be so excessive as to interfere with its fertility, although inexhaustible quantities of plant foods are present.

Mr. Thomas H. Kearney exhibited a large series of photographs illustrating the characteristics of the flora of the swamp. The various plant-associations were enumerated and described at length, and their relative importance in the formation of humus was noted. Reference was also made to the possible effects of the acidity and generally low temperature of the water as agents likely to retard growth and to require adaptations against excessive transpiration. The woody type of vegetation predominates, there being very few herbaceous species